






High Station Count Controller

A B-hyve[®] Pro Connected Device

Beta unit Installation and Operation Guide

MODEL: HSC-1600-M

SYMBOL DEFINITION

SAFETY CODES	
 DANGER	An immediately hazardous situation. If the hazardous situation is not avoided, death or serious injury will occur.
 WARNING	A potentially hazardous situation. If the hazardous situation is not avoided, death or serious injury could occur.
 CAUTION	A potentially hazardous situation. If the hazardous situation is not avoided, minor or moderate injury could occur.
NOTICE	A property-damage-only hazard, meaning no personal injury is possible.
SAFETY INSTRUCTIONS	Indicates safety-related instructions, procedures, or the locations of safety equipment.

FCC AND IC STATEMENT

This device complies with Part 15 of the FCC Rules and Industry Canada license exempt RSS standards. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Warning: Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate this equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one of the following measures:

- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This Class B digital apparatus complies with Canadian ICES-003

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Note: 5150~5250MHz is Indoor use only.

DÉCLARATION DE FCC ET L'IC

Cet appareil est conforme à la section 15 de la Règlementation de la FCC et la norme RSS d'Industry Canada. Son fonctionnement est soumis aux deux conditions suivantes:

(1) cet appareil ne doit pas causer d'interférences nuisibles, et

(2) cet appareil doit tolérer toutes les interférences, dont les interférences pouvant causer un fonctionnement non désiré.

Cet appareil numérique de classe B est conforme à la norme canadienne ICES-003.

Remarque: cet appareil été testé et déclaré conforme aux limites d'exposition pour les appareils numériques de classe B, selon la section 15 de la Règlementation de la FCC. Ces limites sont conçus pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet appareil produit, utilise et peut émettre de l'énergie radio fréquence et, si elle n'est pas installée et utilisée conformément aux instructions, peut causer des interférences nuisibles aux communications radio. Cependant, il n'est pas garantie que des interférences ne se produisent pas dans une installation particulière. Si cet appareil cause des interférences gênantes à la réception d'un signal radio ou de télévision, ce qui peut être déterminé en allumant et en éteignant l'appareil, l'utilisateur peut corriger les interférences en suivant une des mesures suivantes :

- Augmentez la distance entre l'appareil et le récepteur.
- Branchez l'appareil dans une prise sur un circuit différent du circuit sur lequel le récepteur est branché.
- Consulter le revendeur ou un technicien radio/TV expérimenté pour obtenir de l'aide.

Cet appareil numérique de classe B est conforme à la norme canadienne ICES-003.

Ce matériel est complété par une exposition de rayonnements IC pour un environnement naturel. Ce matériel doit être installé et se faire avec une distance minimale de 20cm entre les radiateurs et les autresYour body shop.

Safety Information

Warning: A circuit breaker or cutoff switch shall be installed in the wiring to isolate the controller

Warning: Date and time on the controller are maintained by a long-life lithium battery. This battery shall be disposed of in accordance with local regulations.

Contents

SYMBOL DEFINITION	2
FCC AND IC STATEMENT	2
DÉCLARATION DE FCC ET L'IC	2
Safety Information	3
Welcome to the Hydro-Rain Family.....	6
HSC Controller	6
Controller Features	6
B-hyve Pro	6
Need Help?.....	6
HSC Hardpoints	8
1. Ethernet Connection	8
2. USB Power Port	8
3. Display	8
4. Buttons	8
5. Core terminals.....	8
6. Battery.....	8
7. On/Off Switch	8
8. Status LED Lights	8
9. Cellular Antenna	8
10. Wi-Fi, Bluetooth, and 900 MHz Antenna	8
Menu Overview:.....	10
Transformer	10
Setup	11
Setting Day and Time	11
Programming	11
Set P/MV Operation.....	11
Basic Operation	11

Manual Operation	11
Sensor Alarm Bypass	11
Fault Alarms	11
VIEW FLOW	12
Setting up flow	12
Functions and Definitions	13
Stop Menu.....	13
System Off.....	13
Pause	13
Stop All Irrigation	13
Timed Off	13
Selective Stop.....	14
Station Menu	14
Station Setup.....	14
Testing a station.....	14
Set a station as a Master Valve.....	14
Set Normally Closed / Normally Open valve operation.....	15
Flow Management	15
Flow Assignment.....	15
Learn Flow Rate	15
Flow Delay.....	15
Setup Screen	15
Language	15
Set Time	16
Daylight Savings	16
Time Format.....	16
Date.....	16
Date Format	17
Units of Measure.....	17
Pump and Master Valves (P/MV) Screen.....	17
Terminal Settings	17

Set a station as a Master Valve	17
Set NC/NO valve operation	17
Reset menu	18
Reset Programs	18
Reset Flow	18
Reset Programs and Flow	18
Factory Reset	18
System Update	18
Networking menu	18
System Update	19
Current Connections	19
Wi-Fi Reset	19
900 MHz	19
Bluetooth	19
Cellular	19
Pairing	19
MAC ID / Owner	19
Diagnostics menu	19
View Log	19
Solenoid Diagnostics	19
Pump, Master Valve Log	20
Flow Log	20
Connection Log	20
Manual menu	20
Station	20
Programs	20
Test ALL	20
Test by Flow Assignment	20

Welcome to the Hydro-Rain Family

Thank you for your purchase of the weather-based, smart irrigation, High Station Count Controller!

We understand that time is money, so our products are designed to save you time. Whether it is programming a controller, installing the system, or adjusting the system our products go together faster and easier.

HSC Controller

Smart. Adaptable. Formidable.

Hydro-Rain has focused on making products faster and easier to use. The High Station Controller is the latest evolution of those ideals. Designed to be a B-hyve Pro connected controller, it can replace most systems in the market, and provide years of dependable service.

Controller Features

- Flow, Solenoid, and Sensor Management
- Designed for B-hyve Pro
- 48 station capable in 8 station increments
- 63 station capable with Two-wire AC technology
- Outdoor-rate Powder-coated enclosure
- Movable transformer for retrofit applications

B-hyve Pro

The B-hyve Pro app is designed for contractors, with advanced Bluetooth, mapping, and Relationship Management tools

The B-hyve Pro app is required to program the HSC Controller. If you haven't already, download the B-hyve pro app.



Need Help?

Contact Hydro-Rain Product Support

The Hydro-Rain Product Support team is here to help, whether it's setting up your new controller, programming or troubleshooting questions, our friendly staff is here to assist. We have a trained bilingual English and Spanish speaking staff who can provide you the technical assistance you need whether you are the installer or the maintenance provider.



call us

1-801-299-5550



email us

ProductSupport@hydrorain.com



text us

801-905-8260

or visit us at



hydrorain.com



HSC Hardpoints

Physical touchpoints to use the HSC:

1. Ethernet Connection

Used for a hardwire internet connection

2. USB Power Port

A charger your phone or tablet.

3. Display

Shows alerts, current status, upcoming watering events, and remaining runtime

4. Buttons

Look to the display screen to see what the buttons does. The function of these buttons' changes based on the screen you are in, or what the controller is doing.

5. Core terminals

Connect 2 flow meters, 2 Master Valves or Pump Starts, 2 Weather Sensors, and supply power with one 24VAC output

6. Battery

Saves date and time only. Program settings and other data are nonvolatile and do not require battery backup! Replaceable internal lithium battery located next to the on/off switch. The battery may last the life of the controller but is easily replaced if necessary. Use a standard CR2032 or equivalent replacement if necessary. Be sure to place the + side of the battery correctly.

7. On/Off Switch

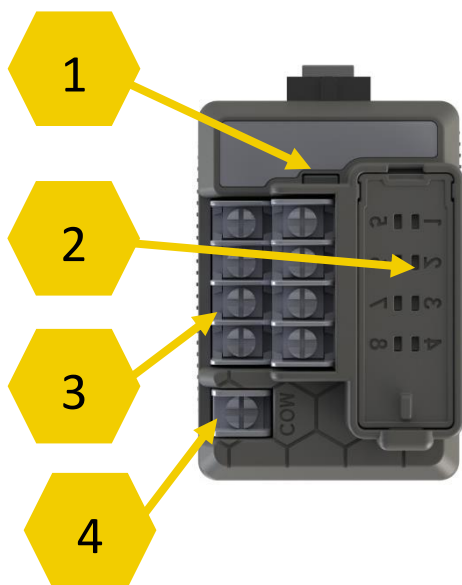
Turns the controller on or off. Useful when adding or removing modules or interacting with the Core Terminals.

8. Status LED Lights

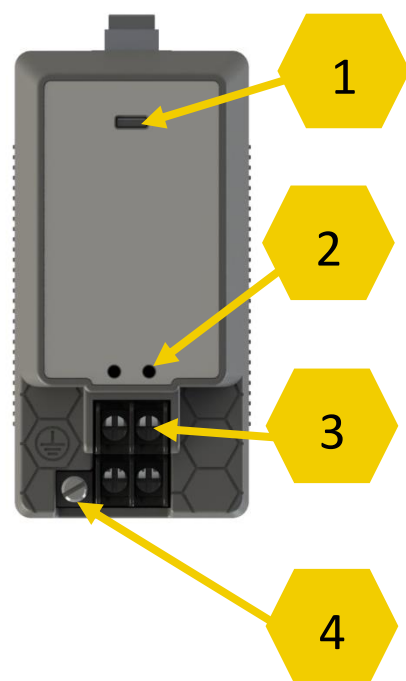
Indicates controller status, Wi-Fi, and Cellular (If installed)

9. Cellular Antenna

10. Wi-Fi, Bluetooth, and 900 MHz Antenna



1. Release button for easy removal
2. Activity lights shows water status
3. Terminal Screw
4. Common or grounding terminal



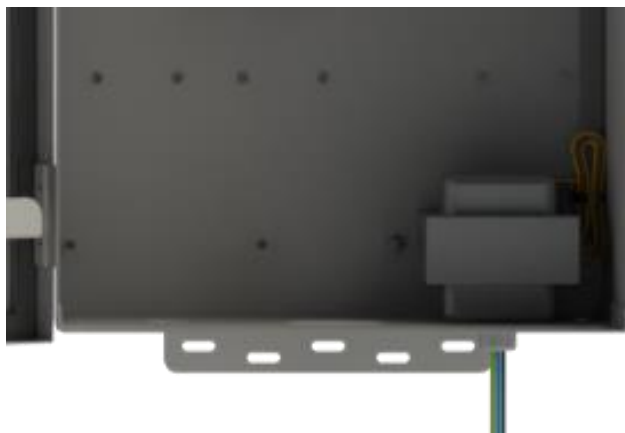
- Before installing or removing modules turn off power using the on/off switch.
- DO NOT pull the modules out until the release button has been fully depressed.
- The number plate on the 8-station module is keyed so that the stations can to be identified by the controller quickly. If there are duplicate number plates, the first module connected will be used, and the duplicate ignored.
- Only one Two-wire module (installed in the center) can be used at a time.

Menu Overview:

STOP	STATIONS	SETUP	Pump & Master Valves	RESET	FLOW	NETWORKING	DIAGNOSTICS	MANUAL
System Off	Setup	Language	Select Pump or Master Valve	Programs	Flow Assignment	System Update	Fault Log	Station
Pause Irrigation	Set Station as Master Valve	Time	Set Station as Master Valve	Flow	Manual Learn Flow	Current Connection Status	Solenoid Diagnostics	Program
Stop All Irrigation	Flow Assignment	Date	NC/NO valve selection	Programs & Flow	Flow Delay	Wi-Fi Reset	Pump and Master Valve Log	Test
Timed Off	Manual Learn Flow	Units of Measure		Factory Reset		900 MHz	Flow Log	Flow Assignment
Selective Stop	Flow Delay			System Update		Bluetooth®	Connection Log	
						Cellular		
						Pairing		
						MAC ID & Linked B-hyve Account		

Transformer

The HSC is shipped from the factory with the transformer on the right side of the enclosure. This enclosure design allows the transformer to be moved to the left side to accommodate electrical connections as needed. The mounting bracket is interchangeable to simplify relocating the transformer to the left side when necessary.



The transformer is grounded through the case. Connect all Grounding wires to wire lug next to transformer.

For 120-volt applications use the black and white wires. Cap the blue wire.

For 240-volt applications use the Blue and White wires. Cap the Black wire.

Setup

When the system first powers on it will run several checks. You may see several messages on the screen and notice that alerts may activate. This is normal. Once the system checks have completed you can pair to the HSC and begin the setup process.

Setting Day and Time

During the pairing and setup process the HSC will automatically set the day and time. If the day or time needs to be adjusted Press Main Menu button and scroll to Setup and select time or date. Different formats are available in the time and date menus

Programming

To Program, pair the controller your smart device and open your B-hyve Pro app

Set P/MV Operation

Use the B-hyve Pro App or from the Controller:


- To set valve as a Master Valve press Main Menu and scroll to Pump & Master Valves
- Scroll to Set Station as Master Valve and select the station so set as a Master Valve
- Valves are set to Normally Closed by Default
- Press Main Menu and scroll to Pump & Master Valves
- Go to NC/NO Valve Selection to change valve settings

Basic Operation

Full functionality is available from the B-hyve Pro app or dashboard. A limited feature set is available at the controller.

Manual Operation

Use the B-hyve Pro App or from the Controller:

- From Home screen, press Manual  then scroll to select Stations, Program, or Test.
- **Stations:** Enter Station number. Enter Run Time to run the items immediately.
- **Programs:** Select Program number to start immediately. Press fast forward to skip stations.
- **Test Program:** Test will run all stations in the controller for the run time entered here. Press fast forward to skip stations.

Sensor Alarm Bypass

Use the B-hyve Pro App or from the Controller press the play button located on the home screen to override.

Fault Alarms

Use the B-hyve Pro App

- If a fault was detected it is recorded in the log.
 - At the controller Press the triangle with an exclamation point to see the log file.

VIEW FLOW

Use the B-hvy Pro App

- When flow meters are installed and configured, Flow will show on the Home screen.

Setting up flow

The HSC is compatible with the following Flow meters

- Data Industrial (Badger Meter) IR-220 Series (PVC models)
- Creative Sensor Technologies FSI-T Series
- Netafim Reed Switch Register-type Series
- Bermad 900 Series Reed Switch Register-type Series

To add a flow meter power down the system following the OSHA standard for The Control of Hazardous Energy (Lockout/Tagout).

CAUTION: If the HSC is not powered down a potentially hazardous situation exists; minor or moderate injury could occur Turn off power before installation by following the OSHA standard for The Control of Hazardous Energy (Lockout/Tagout) (29 CFR 1910.147).

1. Once the HSC has been powered down attach the flow meter per the flow meter instructions.
2. For faster installation use the B-hvy Pro App
3. Select the sensor input number to be setup (1-2).
4. Select the Flow Sensor Style and enter the calibration information. Some use K-factor and Offset, and others are Pulse type. Consult the flow meter supplier's documentation for the correct settings or contact Hydro-Rain Technical Support for additional information.

	Brand	K-Factor	Offset	Pulse
Terminal 1				
Terminal 2				

Functions and Definitions

Stop Menu

In the Stop Menu you can find most options to stop, delay or pause watering events

System Off

- Stops all irrigation and places controller in off mode
- Can be used at end of season to stop all watering

Pause

Interrupts whatever is currently running, until either Resume is pressed, or 30 minutes have passed (count down is shown on screen).

Anything running will be resumed where it left off and run for its remaining time. When the controller resumes, all remaining events will be pushed back equal to the time the system was paused. *This will cause irrigation to end later than usual!*

By taping the “pause ||” button again irrigation can have another 30 minutes added to total pause time.

If the buttons corresponding to cancel or play is pressed by you are returned to prior screen and watering is resumed.

Stop All Irrigation

Stops everything that is watering or running immediately.

The controller is still in automatic irrigation mode and will resume watering at the next scheduled start time.

Timed Off

Stops all irrigation and places controller in off mode for a specified number of days. The letters “DD” flash on screen until you press up or down to select a number. You can select between 0 and 28 days for the delay. 0 cancels the delay and returns you to the home screen.

Once you select a number the system will wait 5 seconds before accepting number. You can also press the middle button to accept the number on the screen and continue.

Once timed off days is set, the system will return to home screen

You can still operate the system manually and test the system.

The Play button will appear on the home screen after timed off is activated and will return you to the Timed off screen to cancel timed off. Set the number of days to 00 to cancel the timed off.

Selective Stop

Allows user to selectively stop what is watering.

The controller is still in automatic irrigation mode and will continue watering all other programs or stations.

Once stopped the station or program will not water until watering is resumed. The "Play" button can be pressed to resume watering, and cancel selective stop, at any time.

Faults and delays will display over selective stop information

Station Menu

Station Setup

Only connected stations appear in this screen. A low charge is sent through wires to check for connected stations. An option to test appears in screen so you can test a station.

Testing a station

The “##” flash until the you press up or down to select a number. You can only cycle through connected stations identified earlier. Once you have selected a station the screen will advance to select the run time.

A default of 10 minutes appears and is flashing until you press up, down, or enter.

You can stop the test, return to prior menu, or add more time to test. You can tap the “PLAY” button to add additional time to runtime. The previously entered runtime will be added to current runtime.

For example: You accept the 10-minute default, after 5 minutes you press the Play button again. An additional 10 minutes is added to the current run time.

Set a station as a Master Valve

MV Settings Screen allows a user to define a station as a Master Valve.

The “##” flashes until you press up or down to selects a number. Entering 0 exits to prior screen and you can only cycle through connected stations. Pressing enter automatically accepts the number and moves you to the confirmation screen.

The System will wait on the confirmation screen until a choice is made to set the station as a master valve.

Set Normally Closed / Normally Open valve operation

The PMV Settings Screen allows user to define if station is normally closed or normally open. All valves are considered normally closed, until changed. If a valve is set as normally open this screen can change it back to Normally Closed.

The “##” flashes until you press up or down to select a number. Entering 0 exits to prior screen and you can only cycle through connected stations. Pressing enter automatically accepts the number and moves you to the confirmation screen.

Flow Management

Flow Assignment

Allows you to define which hydraulic line a station is on. If not used, all stations are placed on hydraulic line one.

Hydraulics lines shall be equal to the number of Pumps or Master Valves configured on the controller.

Learn Flow Rate

Allows the system to learn flow on a line, this user-initiated process is required before Flow Delay can be used. The system always monitors and records flow when a flow meter is connected. The Learn Flow Rate allows you manually trigger a learning period. This is useful when first setting up your controller, or when first installing a flow meter.

Flow Delay

Sets the amount of time the station can run before high or low flows will cause an alarm. Flow must be learned first by either using the Learn Flow Rate or giving the system time to learn flow.

You can also set upper and lower limits before an alarm is triggered. A time delay allows flow to stabilize before system checks for high or low flow. You can adjust the default 5-minute delay down to 1 minute or up to 10 minutes before system checks flow. You can adjust the default 110% to 90% alarm threshold in 1% increments from 101% to 150% or from 99% to 50%

Setup Screen

Here is the basic setup and settings for the controller you can use after initial setup has been completed. If the device is connected these settings can be transferred or updated through the app or server

Language

You can change the default/primary language on device from this screen. A power loss or system reset (except the factory reset) will not change this setting.

- English (US - Default)

- Spanish (Latin America)
- Portuguese (Brazil)
- Portuguese (European)
- French (European)
- Italian (European)
- German (European)
- Polish (European)

Set Time

If you have connected the HSC, the time is automatically set. To manually set or change the time following the instructions below.

The “HH” will flash until you press up or down to select a number. As you cycle through 1-12, the system should automatically switch between AM and PM. Once you select a number the system will wait 5 seconds before moving to the minutes.

The “MM” should flash until you press up or down to select a number. If the button is held for 3 seconds the minutes advance by 5-minute intervals.

Once you select a number the system will wait 5 seconds before moving back to the Hour. Press enter to select the time and return to the previous screen.

Daylight Savings

If you have connected the HSC, daylight savings is automatically set.

The word “Active” is flashing or otherwise highlighted to indicate that daylight savings is currently enabled. You can press up or down to toggle between active or disabled.

Once Daylight Savings is set, the system will wait for 30 seconds, or for an enter press, before returning to previous screen

Time Format

If you have connected the HSC, time format is automatically set.

The “12 Hour (AM/PM)” format is flashing or otherwise be highlighted. You can press up or down to toggle between 12- and 24-hour formats.

Once time format is set, the system will wait for 30 seconds, or for an enter press, before returning to previous screen

Date

If you have connected the HSC, date is automatically set.

The “MM” will flash until you press up or down to select a number. As you cycle through 1-12, the system should automatically switch between AM and PM. Once you select a number the system will wait 5 seconds before moving to the day.

The “DD” should flash until you press up or down to select a number. If the button is held for 3 seconds the days advance by 5-day intervals.

The “YYYY” should flash until you press up or down to select a number. If the button is held for 3 seconds the years advance by 5-minute intervals.

Once you select a number the system will wait 5 seconds before moving back to the Month. Press enter to select the time and return to the previous screen.

Date Format

If you have connected the HSC, date format is automatically set.

Scroll up or down to select your preferred format. Press enter to select.

- DD-MM-YYYY
- MM-DD-YYYY (Default)
- YYYY-MM-DD
- YYYY-DD-MM

Units of Measure

If you have connected the HSC, Units of Measure is automatically set.

The default or current selection is flashing or otherwise highlighted. You can press up or down to toggle between Imperial or Metric.

If you press the enter arrow the system will display a message alerting user to selected option. Press enter to confirm, or an arrow will take you back to Imperial or Metric selection.

Pump and Master Valves (P/MV) Screen

From this series of screens, you can change the PMV settings

Terminal Settings

This screen allows you to define a terminal as a Pump or Master Valve. Changing this setting adjusts the timing giving pumps time to pressurize or spin down.

Set a station as a Master Valve

From here you can define a station as a Master Valve.

Set NC/NO valve operation

Allows you to define if station is normally closed or normally open. By default, all valves are considered normally closed. If you have set a valve to normally open this screen can also change it back to Normally Closed.

Reset menu

We have different levels of resets available based on different needs.

	Programs	Flow	Log / History	Firmware		
Reset Programs	Reset	Saved	Saved	Saved		
Reset Flow	Saved	Reset	Saved	Saved		
Reset Programs and Flow	Reset	Reset	Saved	Saved		
Factory Reset	Reset	Reset	Reset	Reset		
System Update	Saved	Saved	Saved	Updated		

Reset Programs

Reset Programs by clearing all program information. This process Saves Flow data, saves historical data, saves current firmware version, and Returns to home screen once complete

Reset Flow

Saves Programs, clears all Flow information, Saves Program data, saves historical data, saves current firmware version, Returns to home screen once complete

Reset Programs and Flow

Reset Programs and Flow, saves historical data, saves current firmware version, Returns to home screen once complete

Factory Reset

Clears all Flow data, clears all Program data, clears historical data, clears current firmware version, reverts to original Firmware version, Returns to home screen once complete

System Update

Updates Firmware, saves all Flow data, saves all Program data, saves historical data, Updates current firmware version, Returns to home screen once complete

Networking menu

System Update

Updates Firmware, saves all Flow data, saves all Program data, saves historical data, Updates current firmware version, Returns to home screen once complete

Current Connections

Lists current connections and their status

- Wi-Fi
- 900 MHz
- Bluetooth
- Cellular
- Ethernet

Wi-Fi Reset

If the Wi-Fi has changed, or you wish to disconnect from it, this screen allows you to clear the stored Wi-Fi information.

900 MHz

Lists currently connected devices using 900 MHz

Bluetooth

Allows user to clear Blue-tooth information.

Cellular

Shows signal strength, and current data usage and remaining balance

Pairing

Allows you to return the controller to pairing mode.

MAC ID / Owner

Allows you to view the MAC ID. This screen also shows the B-hyve account company name (If setup) connected to this device.

Diagnostics menu

View Log

Starting with the most recent activity on top you can review what triggered an alarm or fault. It also displays the station, program, day, and time of the fault. You can view prior events by scrolling up or down. Pressing the menu button returns you to the prior screen.

Solenoid Diagnostics

Any solenoids with a fault appeared by default on this screen, you can also test the solenoids to verify proper operation. Any solenoids with abnormal readings are displayed on the screen

Possible faults currently detected are:

- Short for a failing solenoid
- Open for a broken wire or poor contact

Pump, Master Valve Log

If a P/MV is connected anytime it activates a record is made. You can scroll through the activity; the most recent activity is at the top of the list.

Flow Log

When a Flow meter is connected the system automatically records the average flow from readings taken during the middle third of the scheduled runtime. This log displays that reading along with the PMV, station, program, day, and time. Pressing menu takes you back to prior menu, or pressing the arrows allow you to cycle through all events. Each event fills screen, and the most recent actions will show on top

Connection Log

Shows when the device receives or sends information it is logged. Pressing menu takes you back to prior menu, or pressing the arrows allow you to cycle through all events. Each event fills screen, and the most recent actions will show on top

Manual menu

Station

Only connected stations are available for use. When entering this area of the system a low charge is sent through wires to check for connected stations.

You can run all stations or a station for a predetermined time (10 minutes by default). You can also stop the test, return to prior menu, or add more predetermined time to the test by pressing play.

Programs

Only pre-programmed programs, one's setup in the B-hyve Pro app or Pro Dashboard, are shown. You can run a program for their preprogrammed time, stop the test, return to prior menu, or skip a station by pressing the "Fast Forward" button.

Test ALL

Only connected stations are shown and are available. The system sends a low charge through wires to check for connected stations. You can operate the stations for a predetermined time (10 minutes by default), stop the test in process, return to prior menu, or Skip a station by pressing the "Fast Forward" button

Test by Flow Assignment

Allows users to test by flow assignment. 2 stations can be on in the same flow assignment, and only connected stations show. The system sends a low charge through wires to check for

connected stations. The station can run for a predetermined time (2 minutes default). You can also stop the test or return to prior menu.

Station	Program	Runtime	Program	Start Time	Watering Days
1			A		
2			B		
3			C		
4			D		
5					
6			Terminal		
7			T1		
8			T2		
9			T3		
10			T4		
11			T5		
12			T6		
13					
14			MASTER VALVES		
15			STATION #	NC / NO	FLOW ASSIGNMENT
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